



Technical University of Mombasa

Faculty of Applied and Health Sciences

DEPARTMENT OF PURE AND APPLIED SCIENCES
DIPLOMA IN SCIENCE LABORATORY TECHNOLOGY
(DSL T 12S)

ACH 2320 : CHEMICAL ANALYTICAL TECHNIQUES III

SUPPLEMENTARY/SPECIAL : EXAMINATIONS

SERIES: MARCH 2014

TIME: 2 HOURS

INSTRUCTIONS:

You should have the following for this paper

- *Answer booklet*

This paper consists of **FIVE** questions.

Answer Question **ONE (compulsory)** and any other **TWO** questions

This paper consists of 3 PRINTED pages

QUESTION ONE

- a) Differentiate co-precipitation and surface adsorption (4 marks)
- b) Explain how degree of sugar satisfaction affect precipitation rate (4 marks)
- c) Differentiate between power compensated use and Heat flux use (4 marks)
- d) State four properties of an ideal precipitations agent (4 marks)
- e) Outline preparation procedure of composite membrane (4 marks)
- f) Describe decantation procedure as a method of separation (4 marks)
- g) Define the following terms:
 - (i) Glass transition temperature (2 marks)
 - (ii) Thermal transition (2 marks)
 - (iii) First order transition (2 marks)

QUESTION TWO

- a) (i) State two types of ion-exchange membrane (2 marks)
- (ii) State four properties of ion-exchange membrane (4 marks)
- b) Explain the procedure for soxlet extraction (5 marks)

QUESTION THREE

Explain any five factors affecting formation of precipitate (15 marks)

QUESTION FOUR

- a) Explain the gravimetric analysis procedures (7 marks)
- b) An iron ore was analyzed by dissolving 1.1325 sample in concentrated HCl, the resulting solution was diluted with water and iron III was precipitated as hydrous oxide $\text{Fe}_2\text{O}_3 \cdot x\text{H}_2\text{O}$, which was dehydrated to give 0.539g of pure Fe_2O_3 (159.69g/mol)
Calculate
 - (i) The percentage of iron (4 marks)
 - (ii) Percentage of Fe_2O_3 in the sample (4 marks)

QUESTION FIVE

- a) Describe the principle and procedure of affinity chromatography. **(10 marks)**
- b) State five properties of ultra membrane for reverse osmosis application **(5 marks)**